

## **Conflict Resolution Abilities Instrument for Adolescents: Rasch Model Analyses**

Salsabilla Shafa Adzra Darmawan<sup>1</sup>

Universitas Pendidikan Indonesia

[salsabillasad@upi.edu](mailto:salsabillasad@upi.edu)

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**Abstract:** *Conflict is a natural aspect of social interactions and relationships among individuals and groups. Adolescents, in particular, may react inappropriately to conflict due to their unstable emotional development. Such destructive responses can have significant developmental consequences, as adolescence is a critical period for learning how to establish and maintain healthy relationships. Measuring adolescents' conflict resolution abilities is crucial for identifying areas where they may lack skills and need improvement. This study employed Crawford and Bodine's theory of conflict resolution abilities as a framework, developing an instrument consisting of 30 items across six dimensions. The instrument was administered to a sample of 301 high school students. The Winstep application and the Rasch Model Approach were used to evaluate the validity and reliability of the instrument. The results indicated that, while one item was identified as misfitting, the remaining items were deemed suitable for assessing conflict resolution abilities in future research.*

**Keywords:** conflict, conflict resolution, instrument, rasch model

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## **INTRODUCTION**

Conflict is a natural thing in interaction and social interrelation between individuals or groups (Kunaerfi, et al., 2019). There will always be involvement between individuals and it could leads to clash (Nadya, et al., 2020; Susan, 2014). This happened because people may respond to conflict destructively in

such behavior: competition, dominance, aggression, and defense (Wang, et al., 2020; Fisher, 2000). Destructive conflict response can potentially destroy a relationship (Bonache, et al., 2019). In contrast, constructive resolution usually involves problem-solving behavior and proactive thinking on how to deal with the conflict (Wheeler, et al., 2010). It is expected that every individual can respond to conflict constructively.

Although conflict starts early in childhood and persist throughout one's lifetime, scientists have been interested in adolescence because of the perception that this period is rife with damaging conflict. (Shantz & Hartup, 1992; Laursen & Collins, 1994). Adolescents' unstable emotional development causes them to react inappropriately to conflict (Ramadhani, et al., 2011). Teenagers' failure to handle disagreement is what leads to the likelihood of conflict among them. Teenagers in this situation are less able to engage thoughtful discussions about how to resolve disputes, are less able to accept the viewpoints of others, have no sense of desire to make sacrifices, and do not want to acknowledge the authority of others. (Adam, 2019). If adolescence is a crucial time for learning how to establish and maintain relationships for the rest of one's life, then dysfunctional adolescents conflict has developmental repercussions (Jensen-Campbell, et al., 1996).

The way individual respond to conflict can also be called as conflict resolution. According to Crawford & Bodine (1996), conflict resolution occurs when a person changes from direct confrontation to partnering in seeking an agreement that is fair to both parties. Fisher et al. (2000) explains that conflict resolution is an attempt to deal with the causes of conflict and try to build new, long-lasting relationships between conflicting groups. In addition, Mindes (in Sidiq, et al., 2022) argues that conflict resolution is the ability to resolve differences with others and is an important aspect of social and moral development that requires skills and moral judgment to negotiate, compromise, and develop a sense of justice. For that reason, it is important to have a measurement of adolescents' conflict resolution abilities to understand which abilities that they are lack at and which abilities that they need to work on.

Crawford and Bodine (1996) described six basic abilities that must be possessed so that individuals can resolve conflict constructively which are: (a) Orientation ability, includes values, beliefs, attitudes, and tendencies that support the effectiveness of conflict resolution. Orientation skills consist of nonviolence, compassion, and empathy, fairness, trust, justice, tolerance, self-

respect, respect for others, a celebration of diversity and appreciation of controversy; (b) Perception ability, is a capability that includes the understanding that conflict is not solely about reality, but about how individuals perceive reality. Perception abilities consist of the ability to empathize with and understanding other people's points of view, self-evaluating to understand inner worries, avoiding premature judgment and blaming each other to facilitate the exchange of points of view in order to understand each other; (c) Emotional ability, includes behaviors that aim to manage anger, frustration, fear, and other emotions effectively. Emotional ability consists of studying discussion so that you are able to communicate emotions effectively, expressing emotions without violence and dangerous actions, and exercising self-control so that you are able to withstand negative reactions to other people's emotional outbursts; (d) Communication ability, includes listening and speaking behavior so that the parties involved are able to know, understand, and react positively to the facts and feelings that occur between them. Communication ability consist of listening to understand using active listening behavior, speak to be understood, reorganizing overly emotional statements into statements that are more neutral and rational; (e) Creative thinking ability, is an ability that includes behaviors that enable individuals to be more innovative in defining problems and making decisions. Critical thinking skills consist of: thinking about problems from various perspectives, carrying out problem solving by paying attention to the principle of reciprocity; engage in brainstorming processes to create, elaborate and enable diversity of options; and (f) Critical thinking ability, includes actions to analyze, hypothesize, predict, create strategies, compare, clarify and evaluate. Critical thinking skills consist of: thinking about criteria and clarifying them; creating objective criteria; make the existing criteria as a basis for making a choice; plan the next course of action. These six abilities are managed to become aspects and indicators of conflict resolution ability instruments.

To evaluate adolescents' conflict-resolution abilities instruments, this study used the Winstep application and the Rasch Model Approach to. Some research have used the Rasch Model to analyze instruments because of the limitations in the traditional model and the solutions it offers (Nur, et al., 2020). When compared to classical theory, the Rasch Model has a number of advantages, including the ability to predict missing data, provide more accurate estimates or data estimates that best describe a person of high ability, provide a pattern of answers according to the difficulty level, and many others (Taufiq, et al., 2021).

The Rasch Model develops a measurement model that determines the relationship between the level of ability of the respondent (person ability) and the level of difficulty of the item (item difficulty). The Rasch model is an excellent method for constructing instruments or measurements (Nur, et al, 2022). Analysis with the Rasch model resulted in a statistical fit analysis (fit statistic) which provided information to researchers regarding the data collected, whether it was clear that respondents who had high ability gave patterns of answers to items according to their level of difficulty.

Many research about conflict resolution abilities has been done by Ramirez (2010) about impact of cultural intelligence level on conflict resolution ability. Sari, et al. (2008) has also made an investigation of conflict resolution abilities on elementary school students. However, not much research has been done on the conflict resolution ability scale or instrument, especially using the Rasch model approach. This article discussed the results of measuring adolescents' conflict resolution ability with the Rasch model approach, through the Winstep program.

## **METHOD**

This study employed a quantitative approach with a cross-sectional research design. The target population consisted of 8th and 9th graders from four schools in Bandung, Indonesia. A structured questionnaire was utilized as the primary instrument to assess adolescents' conflict resolution abilities. The questionnaire comprised eighteen questions, developed based on six core competencies essential for constructive conflict resolution as outlined by Crawford and Bodine (1996). These competencies include orientation, perception, emotional regulation, communication, creative thinking, and critical thinking.

To ensure the instrument's validity and reliability, the questionnaire underwent a thorough analysis using the Rasch model application. This involved assessing item fit, person fit, and differential item functioning (DIF) to determine whether the questions consistently measured the intended competencies across different subgroups of the population. The collected data was then processed and analyzed to provide insights into the conflict resolution abilities of the adolescents.

## FINDINGS AND DISCUSSIONS

### Findings

The result of conflict resolution abilities instrument on adolescent through Rasch Model were analyzed by unidimensionality, item analysis, rating scale, and instrument analysis will be explained in detail below.

#### *Unidimensional*

Unidimensional analysis revealed some of the characteristics or dimensions on the instrument. The analysis was carried out by looking at the value of the measured value of the raw experience and the unexplained variation in the first to second contrast on output table 23. The measurement of unidimensional criteria can be considered accurate if the raw variance explained by measures is more than 20%. In addition, the typical general notes of interpretation state that 20% to 40% means well, 40% to 60% means good, and up to 60% indicates exceptional.

**Table 1. Unidimensionality**

	Empirical		Modeled	
<b>Total raw variance in observations</b>	25.2	100%	100%	
<b>Raw variance explained by measures</b>	7.2	28.5%	28.2%	
<b>Raw variance explained by persons</b>	2.8	11.1%	11.0%	
<b>Raw variance explained by items</b>	4.4	17.4%	17.2%	
<b>Raw unexplained variance (total)</b>	18.0	71.5%	100%	71.8%
<b>Unexplained variance in 1<sup>st</sup> contrast</b>	1.9	7.7%	10.8%	
<b>Unexplained variance in 2<sup>nd</sup> contrast</b>	1.5	5.8%	8.1%	

The table has shown percentage of the raw variance explained by measures is 28.2%, means the instrument is in well category. While the unexplained variance in 1<sup>st</sup> to 2<sup>nd</sup> contrast of residual is 7.7% and 5.8% for each. For this reason, the instrument can be used to measure adolescents' conflict resolution abilities.

#### *Item Fit Order*

After doing the unidimensional analysis, the item analysis were done by item measure, item fit, and item bias.

**Table 2. Item Fit Order**

Ent ry Nu mb er	To tal Sc or e	To tal Co un t	Me asu re	M od el S. E.	INFIT		OUTFI T		PT- MEAS URE		Ex ac t	M atc h	It e m
					M	ZS	M	ZS	CO	E			
					NS	T	NS	T	RR	X			
<b>14</b>	34 9	16 7	1.02	.11	1.1 4	1. 7	1.0 7	.7	.56	.5 3	31 .2	39. 9	1 4
<b>13</b>	37 1	16 7	.77	.11	1.0 2	.3	.97	-.2	.54	.5 0	27 .7	43. 0	1 3
<b>18</b>	37 4	16 7	.73	.11	.95	-.5	1.0 2	.2	.47	.4 9	42 .9	42. 9	1 8
<b>11</b>	39 1	16 7	.53	.11	1.1 8	2. 0	1.0 5	.4	.49	.4 6	37 .7	45. 1	1 1
<b>6</b>	39 3	16 7	.51	.11	1.1 3	1. 4	1.1 2	1. 0	.42	.4 6	43 .5	45. 2	6
<b>17</b>	39 5	16 7	.48	.11	1.0 4	.4	1.0 1	.1	.45	.4 6	41 .6	45. 3	1 7
<b>8</b>	40 0	16 7	.42	.11	1.0 6	.6	.93	-.4	.45	.4 5	42 .2	46. 6	8
<b>1</b>	40 4	16 7	.37	.11	.77	- 2.	1.0 6	.4	.34	.4 4	47 .4	46. 8	1
<b>16</b>	40 8	16 7	.32	.11	.89	- 1. 2	.83	- 1. 2	.47	.4 3	46 .1	47. 0	1 6
<b>7</b>	41 5	16 7	.22	.12	1.2 3	2. 3	1.1 3	.9	.44	.4 2	44 .2	50. 3	7
<b>10</b>	43 4	16 7	-.06	.13	.78	- 1. 9	1.0 1	.1	.30	.3 7	55 .2	62. 3	1 0
<b>2</b>	44 6	16 7	-.27	.14	.82	- 1. 3	1.1 8	.8	.26	.3 4	63 .6	69. 7	2
<b>4</b>	44 6	16 7	-.27	.14	1.3 4	2. 3	1.1 4	.7	.30	.3 4	68 .2	69. 7	4

<b>15</b>	45	16	-.34	.14	.66	-	.64	-	.41	.3	67	70.	1
	0	7				2.		1.		3	.5	8	5
						6		8					
<b>9</b>	45	16	-.47	.15	.87	-.8	.69	-	.40	.3	79	74.	9
	6	7						1.		1	.2	0	
								4					
<b>5</b>	47	16	-.99	.19	.94	-.2	.77	-.7	.28	.2	85	85.	5
	5	7								5	.1	1	
<b>3</b>	47	16	-	.20	.75	-	.65	-	.29	.2	87	86.	3
	8	7	1.10			1.		1.		3	.0	7	
						1		1					
<b>12</b>	49	16	-	.30	.86	-.3	.89	-.1	.15	.1	93	94.	1
	1	7	1.87							6	.5	1	2
<b>ME</b>	42	16	.00	.14	.97	-.1	.95	-.1			56	59.	
<b>AN</b>	0.	7.0									.3	2	
	9												
<b>S.D</b>	39	.0	.73	.05	.18	.8	.17	.8			18	17.	
	.3										.9	1	

Based on table 3 above, the value of SD is 0.73. This value if combined with others value can be classified into really hard (more than 0.73 SD), hard (0.0 to 0.73 SD), easy (0.0 to -0.73), and really easy (less than -0.73 SD). The conclusion of these categories are written below.

**Table 3. Categories of Item Difficulty Level**

<b>Categories</b>	<b>Values</b>
<b>Really hard</b>	More than 0.73
<b>Hard</b>	0.0 – 0.73
<b>Easy</b>	0.0 – (-0.73)
<b>Really Easy</b>	Less than -0.73

According to the table 4, we can conclude that item number 14, 13, 18 is categorized as really hard. Item number 11, 6, 17, 8, 1, 16, 7 categorized as hard. Item number 10, 2, 4, 15, and 9 categorized as easy. Item number 5, 3, and 12 categorized as really easy.

In order to prevent adolescent misconceptions about any of the questions, it is important to assess the conformity between each question and

model (item fit), which would clarify whether the item is functionally useful when used to conduct the measurement. Table 10 in Winstep's Item Fit Order, which has the columns OUTFIT mean square (MNSQ), OUTFIT Z-standard, and point measure correlation, can be used to examine this (PT MEASURE CORR). Booner et al. (2014) listed the following criteria for determining whether an item is fit or not: (1) the value of OUTFIT MNSQ is more than 0.5 and less than 1.5; (2) the value of OUTFIT ZSTD is more than -2,0 and less than +2.0; and (3) the value of PT MEASURE CORR is more than 0.4 and less than 0.85. If an item satisfies even only one of the requirements, it is said to be fit. It is clear from table 10 in Winstep's analysis of the fit item data that all of the items meet the requirements for outfit MNSQ value and outfit ZSTD value, and some of the items also meet the requirements for PT Measure CORR.

**Rating Scale**

The purpose of the rating scale diagnostic was to determine whether the respondent comprehended the distinctions between the scale 1, 2, and 3 options. If the value of the observed average and Andrich threshold exhibits conformance and increases in each of the answer alternatives, the respondent can understand a different response.

**Table 4. Rating Scale Diagnostic**

Category	Observed	Observed	Sample	INF	OUT	ANDRIC	CATEG			
Label	Score	Count	%	Average	Expect	MNSQ	MNSQ	ANDRICH	THRESHOLD	CATEGORY
1	1	449	15	.03	.12	.90	.78	None	(-1.43)	
2	2	544	18	.81	.64	1.18	1.16	.18	.00	
3	3	201	67	1.42	1.44	1.07	1.04	-1.8	(1.43)	

The outcome of the rating scale diagnostic reveals that the observed average and Andrich threshold values are out of sync, while the rating scale also shows an increase. It can be concluded that the respondent can comprehend the differences between selections 1, 2, and 3 and employ those three options.

**Measured Person and Item**

To analyzed the instrument, the information from table 3.1 in Winstep of Summary Statistic is used. The Summary of 167 measured person and 18 measured items are written below.

**Table 5. Summary of 167 Measured Person**

	Total Score	Count	Measure	Model Error	Infit		Misfit	
					MNS Q	ZST D	MNS Q	ZST D
<b>Mean</b>	45.4	18.0	1.31	.52				
<b>S.D.</b>	5.6	.0	1.11	.40				
<b>Max.</b>	54.0	18.0	4.17	1.80				
<b>Min.</b>	29.0	18.0	-.69	.31	.42	-2.4	.43	-1.9
<b>Real Reliability</b>	<b>RMSE .66</b>	<b>TRUE SD .64</b>	<b>.89</b>	<b>SEPARATION 1.34</b>	<b>Person Reliability</b>			
<b>Model Reliability</b>	<b>RMSE .65</b>	<b>TRUE SD .65</b>	<b>.89</b>	<b>SEPARATION 1.37</b>	<b>Person Reliability</b>			
<b>S.E. OF Person MEAN = .09</b>								
<b>Person RAW SCORE-TO-MEASURE CORRELATION .90</b>								
<b>CRONBACH ALPHA (KR-20) PERSON RAW SCORE "TEST" RELIABILITY .76</b>								

**Table 6. Summary of 18 Measured Item**

	Total Score	Count	Measure	Model Error	Infit		Outfit	
					MNS Q	ZST D	MNS Q	ZST D
<b>Mean</b>	420.9	167.0	.00	.14	.97	-.1	.95	-.1
<b>S.D.</b>	39.3	.0	.73	.05	.18	1.6	.17	.8
<b>Max.</b>	491.0	167.0	1.02	.30	1.34	2.3	1.17	1.0
<b>Min.</b>	349.0	167.0	-1.87	.11	.66	-2.6	.64	-1.8
<b>Real Reliability</b>	<b>RMSE .15</b>	<b>TRUE SD .96</b>	<b>.71</b>	<b>SEPARATION 4.76</b>	<b>Person Reliability</b>			

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<b>Model RMSE</b>	<b>.15</b>	<b>TRUE SD</b>	<b>.71</b>	<b>SEPARATION</b>	<b>4.87</b>	<b>Person</b>
<b>Reliability</b>	<b>.96</b>					

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**UMEAN=.0000 USCALE=1.0000**

**Item RAW SCORE-TO-MEASURE CORRELATION = -.96**

**2772 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 4125.87**  
**with 2600 d.f. p=.0000**

**Global Root-Mean-Square Residual (excluding extreme scores): .6405**

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In the conflict resolution abilities instrument, individual separation demonstrates how evenly a group of items is distributed across the spectrum of logical abilities. Because the components in it can be used to reach people with high to low levels of ability, the wider the individual gap, the better the instrument will be. While the item separation demonstrates how evenly distributed over a linear scale the sample being measured is. The measurement will be more accurate the higher the grain separation. The meaning of the construct being measured can also be determined using this index.

From table 6 and 7 it is known that the separation for persons in the table for persons is 1.34 and for items is 4.76. The greater the separation value, the better the quality of the person and instrument as a whole. The separation value is calculated more accurately through the formula:  $H = \{(4 \times \text{separation}) + 1\} / 3$ . Thus the value of separation for persons is 2.12, while the separation for items is 6.68. This shows that the quality of the participants is in the good category.

### **Discussions**

The purpose of this study was to analyze the reliability and validity of the Conflict Resolution Ability instrument using the Winstep application with the Rasch Model approach. The results of the Conflict Resolution Ability instrument through the Rasch model were examined based on the aspects of unidimensionality item analysis (difficulty level of item items and level of suitability of item items), and instrument analysis.

The extent to which the diversity is measured by an instrument to find out whether the instrument can measure what it should be can be analyzed using dimensional analysis (Higgins, 2007). Dimensions are a fundamental measure for determining the construct validity of an instrument (Durututk, et al., 2015). It is also explained that unidimensionality can be done with items that measure only one latent variable (Hansen & Kjaersgaard, 2020). Based on the results of unidimensionality, it shows that the conflict resolution ability instrument can

measure all variables because the value shows more than 20%. (Andrich, 2010). This shows that in the instrument has been able to measure every single attribute. Furthermore, the unexplained variance value of 5.8%-7.7% indicates that this value meets the requirements, which is less than 15%. So the level of the instrument can be said to be ideal (Boone, et al., 2014).

Based on the analysis of the difficulty level of items, it was found that item number 14, 13, 18 is categorized as really hard. Item number 11, 6, 17, 8, 1, 16, 7 categorized as hard. Item number 10, 2, 4, 15, and 9 categorized as easy. Item number 5, 3, and 12 categorized as really easy. The classification obtained based on the combination of standard deviation (SD) value and the average logit value (Hamdu, et al., 2020). This would show the proportion of respondent who can answer the question in such categories (Sumintono, 2018).

Item Fit Order analysis aimed to find out unfitted item criteria (Suraji, 2019). Booner et al. (2014) listed the following criteria for determining whether an item is fit or not: (1) the value of OUTFIT MNSQ is more than 0.5 and less than 1.5; (2) the value of OUTFIT ZSTD is more than -2,0 and less than +2.0 (Ee., dkk, 2018) ; and (3) the value of PT MEASURE CORR is more than 0.4 and less than 0.85. If an item satisfies even only one of the requirements, it is said to be fit. It is clear from table 10 in Winstep's analysis of the fit item data that all of the items meet the requirements for outfit MNSQ value and outfit ZSTD value, and some of the items also meet the requirements for PT Measure CORR.

Rasch technique provides a variety of methods by which nuances of functioning of the rating scale can be evaluated (Shahat, et al., 2022). The outcome of the rating scale diagnostic reveals that the observed average and Andrich threshold values are out of sync, while the rating scale also shows an increase. It can be concluded that the respondent can comprehend the differences between selections 1, 2, and 3 and employ those three options. Lastly, Person Infit MNSQ and ZSTD identified whether an individual responds to each item in a manner predicted by the Rasch model analysis (Lah, et al., 2021) from table 6 and 7 it is known that the separation for persons in the table for persons is 1.34 and for items is 4.76. The greater the separation value, the better the quality of the person and instrument as a whole. The separation value is calculated more accurately through the formula:  $H = \{(4 \times \text{separation}) + 1\} / 3$ . Thus the value of separation for persons is 2.12, while the separation for items is 6.68. This shows that the quality of the participants is in the good category.

## CONCLUSION AND RECOMMENDATION

The construct analysis from this study highlights several important observations regarding the evaluation of the conflict resolution ability instruments. The results indicate that the measurement tools, while informative, are not yet fully optimized. Specifically, the instrument only met two out of the three criteria used to determine item fit. Future research is encouraged to focus on examining the Point-Measure Correlation (PT Measure) for items that did not meet the required standards, with the goal of refining and improving the instrument's accuracy and reliability.

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